

the
Delhi
Ridge Forest
DECLINE AND CONSERVATION



KALPAVRIKSH

THE DELHI RIDGE FOREST



Decline and Conservation

Sponsored by Ministry of Environment and Forests under the National Environment Awareness Campaign 1990-91.

KALPAVRIKSH

1991

ABOUT KALPAVRIKSH

Kalpavriksh is a Delhi-based environmental action group. Started by students and young professionals as a response to the growing ecological crisis faced by India, Kalpavriksh works on several fronts: environmental education and awareness, research and investigation, direct action and lobbying, and litigation. It sees environmental problems as emanating from unequal social structures, and believes that a country can develop meaningfully only if ecological sustainability and social equity are guaranteed. Though based in Delhi, part of Kalpavriksh's work is outside. It was the first group to sound an alert about the potential environmental and social destruction threatened by the Narmada Valley Development Project. In association with local villagers, it filed a successful petition against a limestone quarry near Dehradun. It has also taken part in setting up a joint NGO forum on environment and development issues in Delhi, the Vikalp Samiti.

The fight to save Delhi's green areas, especially the Ridge, is Kalpavriksh's most long-standing campaign.

ABOUT THE AUTHORS

A number of Kalpavriksh members have contributed to this booklet, by writing and/or editing parts of it: Aditya Arora, Pallava Bagla, Nandita Hazarika, Ashish Kothari, Ranjit Lal, Subhadra Menon, and Ghazala Shahabuddin. These are people of varied background, including journalism, biology, medicine, geography and sociology.

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Material from this booklet can be freely used, with due acknowledgement to Kalpavriksh.

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1991



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ABBREVIATIONS/ACRONYMS USED IN THE TEXT

CPWD - Central Public Works Department

DA - Delhi Administration

DDA - Delhi Development Authority

DUAC - Delhi Urban Arts Commission

ha. - hectare(s) [1 ha. = 2.5 acres or 100m x 100m;

1 sq.km. = 100 ha.]

m. - metres above mean sea level

NDMC - New Delhi Municipal Corporation

NGO - Non-governmental organisation

TCPO - Town and Country Planning Organization



PREFACE

This booklet on the Ridge forest of Delhi aims to provide basic information on this vital feature of the city. It attempts to fulfil what has been a long-standing need: the collation of all important facts on the Ridge, and presentation of a broad blueprint for its conservation. Such a need has been felt by Kalpavriksh itself in its campaigns, as also by other NGOs, school and college students, concerned citizens, and even the occasional sensitive government official.

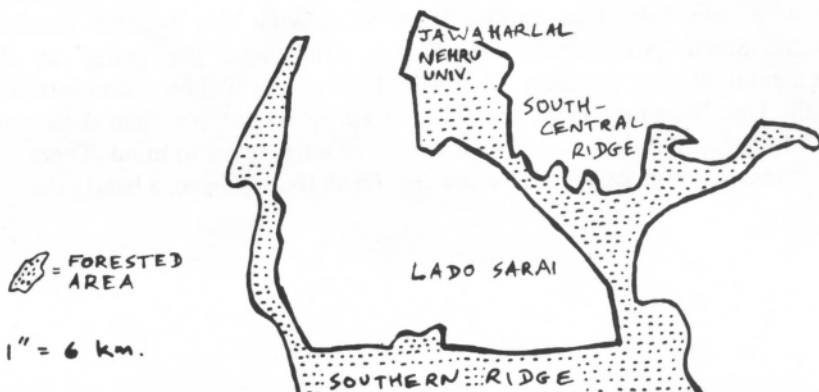
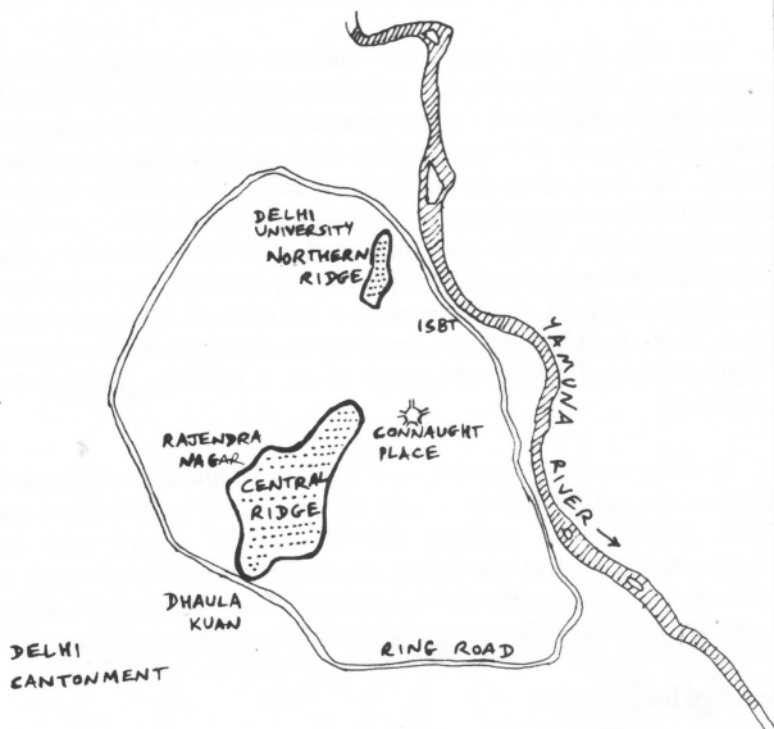
You have in your hands, one outcome of several years of struggle and campaigning, which groups like ours have been carrying on to save the Ridge forest. Delhi's citizens must count themselves lucky to have such a large patch of green wilderness in their midst; most cities in the world cannot boast of such a 'luxury'. Yet most of us do not seem to care, and passively watch it disappear under our very noses; perhaps some of us are even involved in its destruction. The realization that the Ridge is not just another patch of real estate, that its myriad ecological functions are so very important for our lives, has been slow to dawn on the average Delhi-ite. And even where it has dawned, it has not necessarily led to action. If this booklet helps in a small way to dispel this indifference, and to make people aware and concerned enough to act, it will have justified the paper it is printed on.

In other words, please respond! Send in comments, criticisms, suggestions. Keep an eye out for further attacks on the already badly bruised green belts of Delhi. Activate your residents association, your school, your college, your neighbourhood. Report tree-felling, encroachment into forest areas, and all other forms of destruction, to the Delhi Administration or to other official bodies; to the Press; and to NGOs like ours. Join the fight to save our greens!

Acknowledgements

Many people helped in various ways in making this booklet possible. Khushwant Singh, Syed Shafi, Dr. Kumar Ghorpade, the 'gang' at the Environmental Studies Division of Indian Institute of Public Administration (especially Dev Bahadur), many members of Kalpavriksh other than those who wrote and produced it, are a small sample that readily comes to mind. There are several others too, not possible to name here. To all these people, a hearty thanks!

THE DELHI RIDGE



Source: DELHI: ENVIRONMENT STATUS REPORT (DRAFT), WWF-I, DELHI, 1988

INTRODUCTION: A BIT OF HISTORY

A ten minute journey from New Delhi's cacophonous heart, Connaught Place, can see you amidst surroundings that will make you blink and wonder where that teeming city of nine million suddenly vanished. For here, in the heart of the capital's fabled Ridge, the only sounds to be heard are the plaintive "pateela! pateela! pateela!" of the Grey partridge, the merry whistles of a Magpie-robin, and the songs of myriad other birds. The ever-present roar and shriek of traffic is magically erased and the tranquility is complete. Well....almost complete. The story of the Ridge is not quite so tranquil; judging by the way things are going - it may not have the happy ending it so 'naturally' deserves.

What exactly is the Ridge? The Ridge is actually an extension of the Aravalli Hills, that enter Gurgaon from the south and sprawl towards Delhi in the form of a tableland, some five kilometres across. 16 kilometres south of the city, the range splits, with one branch turning sharply to re-enter Gurgaon, and the other, continuing in a north-eastern direction, virtually bisecting Delhi and tapering off at the west bank of the Yamuna (See Map 1). This section consists of a low, narrow range of sandstone in which the mica glints and sparkles, and where today the Kikars stand bent and gnarled, their crowns intertwining and shading the area from the harsh glare of the sun.

Officially, the Ridge has been divided into four zones. Outside the city limits, lies the Southern Ridge which is private land and some 6200 ha. in extent [TCPO 1982]. The South-central Ridge, 626 ha. in area, lies where Mehrauli is - and where quarrying and construction work has devastated it almost completely. Within the city, just north of Dhaula Kuan, flanked on one side by Sardar Patel Marg and on the other by colonies like Rajinder Nagar, lies the still green and inviting Central or New Delhi Ridge, 864 ha. in area. The smallest section, the Northern or Old Delhi Ridge, 87 ha. in extent, lies like a sliver of salvation, between Civil Lines and the University of Delhi. It is these two last-mentioned sections that form the "green lung" of urban Delhi, and to which we shall confine our attention in this booklet.

It might be surprising to learn that this "green lung" was not completely a gift of nature. A lot of the vegetation on the ridge has been planted, and some of it is not indigenous to the region. Before the first independence struggle (the so-called 'mutiny') against the British in 1857, the Ridge, a hard rocky area, supported a natural scrub with Kikar (*Acacia* sp.) being the dominant tree [Ganguli 1975]. A few years later, the British began extensive tree-planting. According to municipal records, about 3000 Neem (*Azadirachta indica*) and Babul (*Acacia nilotica*) were

planted between 1878 and 1879. However, the real impetus came in 1912, when Delhi became the Capital and Lutyens arrived to design the new city. The business of afforestation of the Ridge was taken up by the Delhi Town Planning Committee and the newly formed Delhi Administration. The man in charge was William Robertson Mustoe, who also had the responsibility of planting trees in the newly built capital. Lutyens demanded that both Ridges be fenced in and declared Reserve Forests - which was done in 1878 [Ganguli 1975] - so that no tree could be cut without written permission. Afforestation of the Northern Ridge began in 1913, and a year later, experimental afforestation commenced on the New Delhi Ridge. Initially, planting was confined to indigenous species such as *Prosopis cineraria*, *Acacia nilotica*, *Salvadora oleoides* and *Salvadora persica*. Mustoe later introduced such species as *Prosopis juliflora* - the Mexican kikar - which has good drought resistant properties and which is almost indistinguishable from the local Babul species, *Acacia nilotica*. Gradually the Ridge was covered with this, and by 1939 had more trees as part of the forest community. But it was a tough battle all the way. Six years earlier, in its report of 1932-33, the Administration of Delhi Province had said:

"In the prevailing condition of soil and climate, coupled with the destruction by cattle and wild animals, replenishment of the ground by natural regeneration cannot be expected and it is mainly due to the operation of planting and precaution taken for the protection of young trees that the vegetation of the Ridge has developed into its present state" [Ganguli 1975].

The British however, were not the first to make an attempt to afforest the Ridge. Five hundred years before them, the emperor Firoz Tughluq, who had a passion for game, fenced in a section of the Ridge (now in Old Delhi), planted trees and built hunting lodges in a park called Kushak-i-Shikar [Ganguli 1975]. Today, only two of the buildings still remain, both near Hindu Rao Hospital on the Northern Ridge.



Historically too, the Ridge has played a vital role in the affairs of Delhi. All the seven cities (some say more) that were built and destroyed in what today forms the Union Territory, came up in the triangle of land formed by the Ridge and the river. Not one city before the present one crossed either of these natural boundaries. During the independence struggle of 1857, the Ridge proved of enormous military significance to the British. Their cantonment lay a little beyond - where today Delhi University is - so it was from the Northern Ridge that they planned and executed the attacks for the taking of Delhi from the independence fighters. As mentioned, at that time the Ridge was covered mainly by low scrub, so from a place like the Flagstaff Tower, an excellent view of the city could be had. The Flagstaff Tower incidentally became a rallying point for the British refugees, and many women and children took shelter within its thick solid walls.

Today the Ridge is vital to the city's well-being for other reasons (see Chapter 5). First of all it serves as a sort of giant central air-conditioning plant - enter its precincts on even the hottest of summer days and you will immediately experience a perceptible drop in temperature. Further it provides the increasingly polluted capital with oxygen, as well as absorption of pollutants; it blocks the dust and tames the hot dusty 'loos' that sweep across the city in summer; it acts as a massive sound insulator, absorbing some of the hubbub of the city. And finally of course it gives the jaded city-dweller a taste of nature, at the doorstep, a place where one can jog, walk or exercise, and replenish one's aesthetically battered senses.

TOPOGRAPHY AND CLIMATE

The Aravalli range, which extends through most of Rajasthan, is almost 800 km. in length. It is one of the oldest mountain systems in India, supposed to have originated in the Pre-Cambrian period, some 1500 million years ago. This hill range reaches to a maximum height (1722 m.) at Mount Abu, Rajasthan; it was apparently once as lofty as the Himalayas, but has been weathered down to its present form over the ages.

The Mewat branch of the Aravallis enters the Union Territory of Delhi from the Southern end and extends like a finger straight to the Yamuna in a north-eastern direction till Wazirabad. The Ridge on its way through the capital is broken into many spurs giving it a fairly disjunctive appearance. Adding to this undulating landscape are the numerous stormwater drains which traverse the Ridge, enhancing the beauty of this wilderness in the midst of Delhi. There are no permanent natural water bodies, though a few artificial ones have been made of late. The District Gazetteer of Delhi (1883-84) records that, in the late part of the last century, the best drinking water was obtained from springs on the Ridge [Ganguli 1975]. There is little evidence that these springs still exist.

The difference between the highest point (near Bhatti at 320 m) and the bed of Yamuna at the old railway bridge is about 110 m. --- not a very significant difference in altitude, but still noticeable in a flat area like Delhi. The 230 m contour line of the Ridge may be considered as the western boundary of the Indo-Gangetic plain.

Delhi can be divided into four well-defined physiographic divisions. These are:

- 1) Khadar (Riverain zone)
- 2) Bangar (Area irrigated by wells and canals)
- 3) Dabar (low-lying, rainfed areas)
- 4) Kohi or Pahari (Hillsides)

The first three physiographic divisions, the Khadar, Dabar and Bangar, are part of the plains of the region, and are now the centre of various human activities like housing and agriculture.

The Kohi or Pahari includes the Ridge, Tughlaqabad, Mehrauli, Fatehpur Beri, and Dera Mandi, all of these being highly rocky and undulating areas. This low plateau is mostly composed of bare and unconsolidated micaceous rocks. Its soil is mainly dry and sandy, lacking humus, and supporting sparse vegetation.

Climate

The typically continental climate experienced by Delhi is characterized by cold winter months and hot, dry summer months. Cool oceanic air is able to penetrate the area only during the months of July, August and September i.e. during the monsoons. The south-west monsoons have a major impact, as almost 80% of the precipitation is received during this period, and affects both the vegetation and the fauna of the area. The Thar desert on the west and south-west, and the Gangetic plains to the east, also influence the general climate of Delhi.

Table-1: Climatic characteristics of Delhi

Season	Duration	Details
Rainy	July - September	Normal rainfall (66.6 cm/yr.)
Winter	November - March	Minimum Temp. 0.6°C in January
Summer	April - July	Maximum Temp. 46°C in June.

Relative humidity, generally low, is high during the monsoon months. There is a high incidence of dust storms in the summer months. Thunderstorms of varying intensity occur in May and August. In May 1950, a storm with 49.6 kmph wind velocity - the highest so far - was recorded.

Corresponding to the climatic seasons, there are correlated changes in the vegetation patterns of the area, with the peak of activity on the Ridge being reached during the monsoon and the post-monsoon period.

FLORA OF DELHI RIDGE

Floral Folklore

It was spring. The old Neem softly cleared his throat as the smoke-laden winds descended on him. Standing on the fringe of the ever receding greenery, he secretly wished his old rickety bones could move. But he wasn't alone. By his side was a middle aged Dhak who had, for years, been spearheading the riot of colour in the forest. And together, they had bravely withstood all onslaughts humans had made.

There was the roar of engines in the distance and soon a screeching Maruti came into view. With bated breaths, they looked on. The usually playful shrubs in the vicinity were also anxious.

Thank goodness! They were only lovers (probably bunking college). For an unspecified length of time they murmured sweet nothings to each other. And since the guy in question was very sure of his love for the girl - with a knife, he proceeded to inscribe the proclamation on the Neem.

The Neem stoically bled.

The Kikar watched in mute anger. But when the lovers were leaving he heard the Neem whisper an unmistakable blessing. Such are the ways of Nature!

Read on.....

The vegetation of the Delhi Ridge is, scientifically speaking, a thorny scrub. Such forests, as described in the Flora of Delhi [Maheshwari 1963] are found distributed in the arid and semi-arid zones of the earth. In the classification of forest types developed by Champion and Seth [1968], the Ridge forests fall in the category of 'tropical thorn forests', and more specifically as 'semi-arid open scrub' of 'rakh' forests. But in its present state, the Delhi Ridge has become a synthetic vegetative stand where native plants are found in co-existence with planted exotics, many of them naturalized plants. (A naturalized plant is one which, having been introduced from another region, has become acclimatized to the local conditions.)

PERMANENT NATIVE VEGETATION

There are some species of plants on the Ridge which occur throughout the year. These plants have characteristics similar to desert plants, in that they exhibit slightly stunted growth, wax coatings and thick or succulent leaves. These species, the permanent vegetation of the Ridge, occur in clumps and do not cover the ground densely, leaving ample space between them. This is typical of an open-canopied scrub where there is abundant sunlight and virtually no competition for light.

Trees

Amongst the most common native trees is the Babul (*Acacia nilotica*), its delicately-leafed branches containing deadly long thorns. Three other species of this genus native to the Ridge are Phulahi (*Acacia modesta*), Katha (*Acacia catechu*) and *Acacia senegal*. The Flame of the Forest (*Butea monosperma*) is an indigenous species too, and one of the prettiest when in bloom. Often, people confuse this tree with the Gulmohar (*Delonix regia*), because the latter also has bright-orange, flame-coloured flowers. Commonly known as Dhak or Palas, *Butea monosperma* is a small tree with its trunk very often crooked. A dye, kesu, is obtained from its flowers, and is used for colouring clothes and during the festival of Holi. Another native species is Rong (*Acacia leucophloea*), characteristic of the hilly tracts in and around Delhi. The leaves of this tree are eaten by goats, but it is interesting to note that the pods are known to be poisonous for cattle. Its pale yellow flowers emanate a fragrance at dusk.

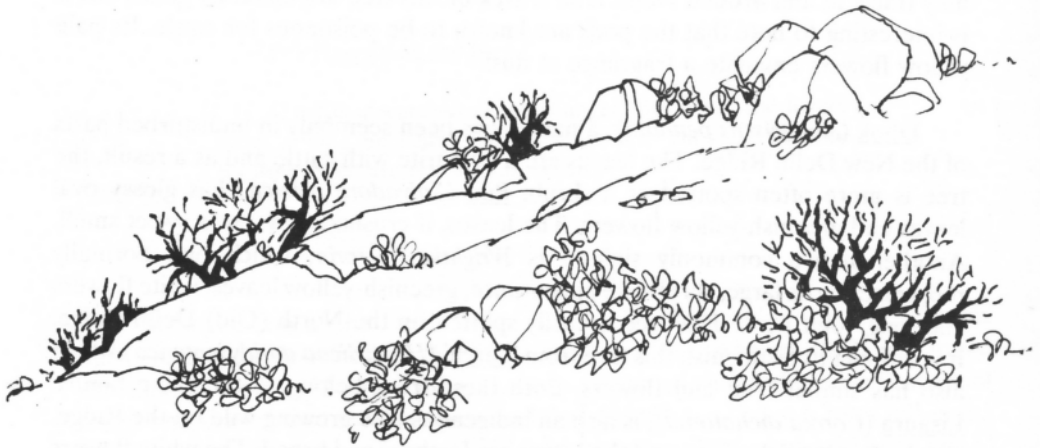
Dhok (*Anogeissus pendula*), a native, has been seen only in undisturbed parts of the New Delhi Ridge. The leaves are a favourite with cattle and as a result, the tree is more often spotted as a shrub. Pilu (*Salvadora persica*) has glossy oval leaves and greenish-yellow flowers. The leaves, if crushed, give out a sweet smell. Another native commonly sighted is *Wrightia tinctoria*, which one normally recognizes by its large, shrub-like appearance, greenish-yellow leaves, white flowers and long, joint pods. This tree is easily spotted on the North (Old) Delhi Ridge. It is difficult to distinguish this tree from Kurchi (*Holarrhena antidysenterica*) which also has similar fruit and flowers. Both these trees belong to the same family. Lisaura (*Cordia dichotoma*), is also an indigenous tree growing wild on the Ridge. The bark is greyish-white, and the leaves are leathery and broad. The white flowers develop into cream-coloured edible fruits which are also of medicinal value.

Desi Papri (*Ehretia laevis*) is a common, deciduous tree with broad, rough leaves and white flowers. There is a beautiful tree called *Tecomella undulata* which occurs naturally on the Ridge. Its leaves are oblong and narrow and the

conspicuous, beautiful flowers are orange-yellow. Ber (*Ziziphus mauritiana*), indigenous to the Ridge, is a small thorny tree with greenish-yellow flowers. It bears yellowish-red fruits, a very popular edible item. Another native tree with commercially viable fruit is Hingot (*Balanites aegyptiaca*). This tree, common on the New Delhi Ridge, has branches ending in straight sharp thorns, and has fragrant, greenish-white flowers. The fruit pulp is an antidote for whooping cough, and the woody portion of the fruit (the endocarp) yields powder used for fireworks. Also, the tree's wood is used as the cobbler's sharpener. A number of other colourful and useful trees are found on the Ridge, such as Amaltash (*Cassia fistula*), Shirish (*Albizia lebbek*), Coral tree (*Erythrina indica*), Pongam (*Derris indica*) and Shisham (*Dalbergia sissoo*).

Shrubs

As important a component as the native trees are the native shrubs. The most dominant among these are Bansa (*Adhatoda vasica*) and Heens (*Capparis sepiaria*). These two shrubs are branched and evergreen. The former is abundant on the North Delhi Ridge and has white or pinkish flowers. The plant has great medicinal value, and is used in cough expectorants, as in *Glycodin-terp Vasaca* and the Ayurvedic Vasaka, named after the shrub's specific Latin name *vasica*. This plant persists in drought conditions because even goats do not relish it. Heens is a climbing shrub with white flowers, and bears berries which are sweet when ripe.



Chabeni or Ramchana (*Grewia tenax*), also a native shrub, is highly branched, with irregularly-shaped leaves, which are rough to the touch. Its fruits are edible.

Jangli karaunda (*Carissa spinarum*) is often seen on the Ridge, and is a bushy evergreen shrub, with white, scented flowers and dark purple berries. Khatai (*Flacourtia indica*), also indigenous, is seen near Mehrauli on the New Delhi Ridge. It is a thorny bush with smooth leaves and edible fruits. Kakera (*Maytenus senegalensis*) is a straggling shrub, with small white flowers. In the monsoon, the thorny shrub *Dichrostachys cinerea* bursts into refreshing blooms of pink and yellow.

EXOTIC VEGETATION

Along with these native plants, discussed above, there are a large number of introduced trees and shrubs which have in time, become naturalized. Most common is *Prosopis juliflora*, commonly known as the Kabuli or Vilayati or Mexican Kikar. Originally belonging to the arid regions of Mexico and Central America, this plant reached India via England in 1877. The tree has become naturalized now, and is very similar in appearance to the native Babul (*Acacia nilotica*). Others, like the Neem (*Azadirachta indica*), Parkinsonia (*Parkinsonia aculeata*), Kaith (*Feronia limonia*), Barna (*Crataeva nurvula*), Kadamba (*Mitragyna parvifolia*), Papri (*Holoptelea integrifolia*) and *Prosopis glandulosa* are all now major members of the vegetation stand that typifies the spur of the Aravallis. Among shrubs, *Jatropha gossypifolia*, a native of Brazil, and *Opuntia dillenii*, a native of S. America, have become naturalized on the Ridge.

SEASONAL NATIVE VEGETATION

As the monsoon arrives, the vegetation undergoes a sea change. A large number of annuals sprout up, carpeting the otherwise stony and rather bare forest floor and creating a bright green hue. By January, their whole life cycle is completed. Amongst the common seasonal plants are: Kasni (*Triumfetta rhomboidea*), with yellow flowers and round, spiny fruits, Din Ka Tara (*Pupalia lappacea*), with flowers in long spikes and polished black seeds, Missi (*Peristrophe bicalyculata*), which has pink flowers and capsular fruits narrowed into a stalk, Sui Ka Ped (*Bidens biternata*) which has white or yellow flowers, typical of the Sunflower family, and needle-like seeds which stick to your clothes and can be troublesome. Santhi (*Boerhavia diffusa*), a creeping herb, is often spotted prostrate on the rocky floor with minute pink or white flowers; the roots of this plant are used as a cure for skin inflammation, while the leaves serve as fodder. Til (*Sesamum indicum*) has pink flowers and black or white seeds, which yield the commonly used til oil. The Tiger-claw (*Martynia annua*) has rose-coloured flowers and typical large, hard fruits with two prominent hooks. Puthkunda (*Achyranthes aspera*) has greenish-white flowers and is a common annual used in indigenous medicine, Kankawwa (*Commelina forskalli*) has two kinds of flowers, the normal

flowers borne aerially and "cleistogamous" ('Cleisto' = hidden, 'gamous' = female) flowers borne underground, and Dudhibel (*Euphorbia hirta*), is a straggly herb with whitish flowers, abundant on the Ridge.

AQUATIC FLORA

This includes the less prominent algae, ferns and angiosperms. Among the algae commonly found in water bodies of the Ridge are *Spirogyra*, *Nitella* and *Chara*. A typical sight on the surface of the Serpentine Lake in the North Delhi Ridge is *Azolla pinnata* - a small water fern which covers the water, and proliferates in winter. During the summer months aquatic angiosperms such as *Lemna paucicostata*, *Chowpatti* spp and *Wolffia* spp, the smallest flowering plant in the world, are found growing profusely on the water surface. *Wolffia* is rootless, and the flowers are seen after the rains. Lower forms of vegetation - mosses and fungi - grow in abundance in the humid months during and after the monsoon. Mosses like *Physcometium* and *Fussaria*, liverworts like *Riccia* and fungi like *Ganoderma* and *Phallus impudicus*, also occur. *Phallus impudicus* is commonly known as the Stinking horn fungus because, when mature, it gives out a foul smell which attracts flies, which disperse the spores.

Thus every season brings a new combination of colours, scents and foliage on the Ridge. Nature has been generous to this ecosystem, and with a little help from humans, its biodiversity has evolved over time. Can we afford to let this wealth disappear at the destructive hands of humankind?

An Orchid in the Delhi Ridge Forest!

Zeuxine strateumatica often escapes attention, being a small herb of 5-10 cm. The flowers are pink, growing in dense clusters and appearing during February-March. Growing amongst grasses and herbs, this is India's most common orchid.

FAUNA OF DELHI RIDGE

The Delhi Ridge, when still an undisturbed natural scrub forest, was a rich repository of animal life which was 'characteristically oriental', as the Delhi Gazetteer records. The fauna was supposedly rich enough in diversity to be compared with that of the nearby forests of Rajasthan. The animals must have been drastically affected by the gradual decimation of the Delhi Ridge forests from the 1930s onward, but no records exist that would help to assess the actual damage. We have to rely on the Delhi Gazetteer of 1976 for information about the animal life existing then. For more complete listings of mammals, birds, reptiles, amphibians, and arthropods found on the Ridge, see Appendices 1-4. Data collected on bird counts and nature walks, by Kalpavriksh and the Ridgewoodpeckers*, and relevant literature, such as the *Journal of the Bombay Natural History Society (JBNHS)*, are the sources of information on present-day fauna.

MAMMALS

It might seem incredible to most of us now, but there was a time (uptil the early part of this century) when Blackbuck, Nilgai and Chinkara roamed the then extensive dry scrub jungles and deciduous plantations of the Ridge. People were even obliged to bypass the dense areas in order to avoid Indian wolves, Striped hyaenas and the occasional Leopard. Jackals, Indian wild boar, Indian hare, and at least one species of fox were a fairly common sight. It was even possible to spot the Indian porcupine and some insectivores like the Indian pangolin, the Grey musk shrew and the Longeared hedgehog, besides of course the omnipresent Rhesus macaque, five species of small rodents, Five-striped palm squirrels, two species of mongoose, and three species of bats. It is clear that a drastic change has occurred in the capital over a period of 5-6 decades whereby this rich ecosystem was reduced to gardens and forested glades, or worst still built-up area, taking a heavy toll of the animal population.

"By 1908, Blackbuck were getting scarce while Nilgai, Leopard and Hog deer had almost disappeared", says the Gazetteer of Delhi [Delhi Administration 1976]. According to Khushwant Singh, an eminent journalist, who has been a keen visitor to the Ridge all through his life, faunal life was rich till the 1940s after which a period of rapid urbanisation and deforestation set in [Khushwant Singh, pers. comm., 1990].

* Nature Club of the Army Public School, New Delhi.

Today the few remaining mammals definitely found are the Five-striped palm squirrel, two species of mongoose, two species of bats, Rhesus macaque (only partially dependent on the Ridge vegetation), Indian hare, the Longeared hedgehog, the occasional Nilgai and some species of rodents. The elusive Jackal still provides the rare thrill to nature-walkers on the Ridge. In 1987, two pairs of Leopard cats were spotted and studied by the Ridgewoodpeckers. This discovery indicated that the Ridge may still contain a few surprises for the intrepid naturalist.

(for a fuller list of mammals, pl. see Appendix 1)

AMPHIBIANS AND REPTILES

There has been no study or survey of amphibians and reptiles in the Delhi Ridge in this century, to our knowledge. The following account is based on a few existing records of the last century, and the experiences of a few naturalists of Delhi.

Among amphibians, the Common toad and Indian bullfrog have been listed in the above mentioned records. Both of these still exist, not only on the Ridge, but in all sparsely wooded areas of Delhi during the monsoon.

The lizards listed are the Northern house gecko, Common garden lizard, Striped grass skink, Spiny tailed lizard and Indian monitor lizard. The present status of the Spiny tailed lizard is not known while the first three definitely exist. The Indian monitor lizard is rare and endangered now on the Ridge. Snakes that have a mention in the records are still sighted occasionally. The poisonous ones mentioned are Indian cobra, Common krait and viper (probably Russells), while others that have been seen are Rat snake, Indian python, Common wormsnae, Common wolfsnae and Leith's sandsnae. The clearing of large areas of forest, including undergrowth, has probably been disastrous for the python and wolfsnae. The current status of the others is not known.

Turtles were supposedly found in the jheels and ponds of the Ridge; however, their present status is not known.

(for a fuller amphibians and reptiles list, pl. see Appendix 2)

ARTHROPODS

A number of the orders among arthropods are represented in the Ridge scrub forest, but the most conspicuous to a casual observer are the many species of

Lepidoptera (butterflies and moths). Various species of dragonflies, damselflies, bugs, flies, beetles, mantises, ants, bees, wasps, spiders, centipedes, millipedes and many other small arthropods also occur, though they are usually less noticeable than the colourful Lepidopterans.

According to one study [Donahue 1966], the wide variety of vegetation on the Ridge is responsible for the occurrence of nearly 70 species of butterflies. These insects prefer the widespread *Lantana camara* for nutrition and egg-laying, while others are attracted by the various gardens and parks in and around the Ridge. *Acacia modesta* and other species of *Acacia* when in bloom are also known to attract many butterflies. There are some species which migrate from the Himalayas but the larger section of the arthropod population is made up of species which are characteristic of peninsular India.

Though insects are found all through the year on the Ridge, the real boom is during the monsoons. This is especially true of butterflies. Several species of pansies (genus *Precis*), orange tips (genera *Ixias* and *Colotis*), and tigers (genus *Danais*) can be seen abundantly, their colours and wing markings standing out against the green foliage. Also plentiful are the tiny grass blues and grass yellows (various genera), flitting about so fast that they scarcely afford a full view.

An insect which simply cannot be missed in the monsoons is the Blister beetle (various genera), so-called because on touch, it secretes a fluid that can cause blisters on the skin! This conspicuous black-and-red beetle is especially common flowering plants. Much smaller, but more well-known, are the ladybirds, also abundant in the summer and monsoon period.

(for a fuller list of arthropods, pl. see Appendix 3)

BIRDS

It would not be an exaggeration to say that the Ridge is the Delhi birdwatcher's paradise. Right in the heart of a bustling city, one can watch and observe an extremely rich variety of birds, which constitute the most conspicuous group of animals living on the Ridge. According to records maintained by a number of groups and individuals, almost 200 species of birds have been reported from the Ridge up till now (See Appendix 4).

Birds in Different Ecosystems

To begin with, there are the dense forest areas as in some parts of the New Delhi Ridge (especially those adjoining Rajendra Nagar) and scattered patches

in the North Delhi Ridge. Then come the scrub areas with scattered trees, which constitute the most extensive habitat. There is the garden ecosystem spreading over large areas in the North Delhi Ridge (such as Kamla Nehru Ridge) and the New Delhi Ridge (such as Buddha Jayanti park). The artificial water bodies and seasonal ponds on the Ridge provide a home for the resident water bird population. Lastly there are old monuments and abandoned buildings scattered here and there, such as the Bisdari building on the New Delhi Ridge and the Kushak Hunting Lodge on the edge of the North Delhi Ridge, possessing their own, distinct bird life.

Dense Forest and Scrub

These first types coexist in most places, and the combination is a boon for the birds which always have plenty to feed on and enough shelter for nests. The scrubby patches have extensive shrubberies and low tree growth, with fruiting plants such as *Zizyphus mauritiana* (Ber), *Salvadora persica*, *Capparis decidua*, *Capparis sepiaria*, etc. Some of these also provide nectar in addition to berries. The fruiting trees adding to this diet are *Butea monosperma*, *Crataeva nurvula*, and species of *Ficus*. Ideal nesting habitat is provided by Kikar (*Acacia* spp.), and Vilayati kikar (*Prosopis juliflora*). The grassy scrub patches support large populations of wren warblers, Grey partridges, and Tailorbirds while the areas with more leafy trees have babblers, drongos, leaf warblers, White-eyes, bulbuls, sunbirds, parakeets and Common peafowl. Kingfishers, woodpeckers, Indian tree pies, munias, Shikras, Green pigeons and even Kestrels can be seen by the more observant birdwatcher.

Parklands

Large areas of the Ridge have been converted into manicured gardens with a few remaining wild patches coexisting alongside. The birdlife is quite different here due to sparse trees and a greater number of ornamental and exotic trees and shrubs.

Apart from the ubiquitous crows, doves, mynas, and sparrows, birds commonly seen here are babblers, parakeets, Common peafowl, Indian tree pies, Magpie-robins, Ashy wren-warblers, and Tailorbirds. The more fortunate birdwatcher may spot the Paradise flycatcher, Greyheaded flycatcher, Shikra, Red munia and Pied crested cuckoo.

Water bodies

There are natural seasonal ponds, both in the New Delhi Ridge and the North

Delhi Ridge, and some artificial ones in the North Delhi Ridge which are perennial. They commonly harbour Indian moorhens, cormorants, Whitebreasted waterhens, Spotbill ducks and egrets which nest among the thick reed beds and *Ipomoea* clumps along the banks. Sometimes the Grey heron and Painted stork may be spotted as well.

Monuments

Abandoned monuments are ideal nesting sites for parakeets, Hoopoes, Blue rock pigeons, Indian robins, swallows and swifts which are adept at finding convenient crevices, walls and ledges to roost and bring up their brood. The Redwattled lapwing often lays its eggs on monument roof-tops.

Garbage dumps

Just off Shankar Road, one would come across incredibly large numbers of vultures, kites and crows which scavenge in the carcass grounds located here. The NDMC garbage dump on Sardar Patel Marg, flanking the New Delhi Ridge is another place where the bird life is dominated by the few species which have adapted to this desecration of the Ridge.

Status of Birds on the Ridge

The birds reported up till now from the Ridge can be classified into six categories: Resident, Winter Migrant, Summer Migrant, Local migrant (moving seasonally between different habitats within the same region), Passage Migrant (i.e. stopping over on way from breeding to wintering grounds in autumn and back in spring) and occasional visitor (or vagrant).

Resident Species

These include the water birds mentioned earlier, as also others. The Scavenger vulture, Whitebacked vulture, Pariah kite, Black drongo, Grey partridge, Common peafowl, Green pigeon, the three species of bulbul found in Delhi, and the Roseringed parakeet are among those seen commonly. Less common and rare residents include the Shikra, Black partridge, Alexandrine parakeet, Crested honey buzzard, Chestnutbellied nuthatch and Yellow-wattled lapwing. These birds have been found nesting here and seem to have adopted the Ridge as their secure haven for breeding. The Yellow-wattled lapwing, however, seems definitely to be on the decline, as its preferred scrub undergrowth disappears.

Winter Migrant Species

During winter months, the resident bird population is greatly augmented by the migratory influx of several species of leaf warblers, whitethroats, wagtails, buzzards, falcons, and harriers, and the Black redstart and Wryneck. Some migrants to the Ridge, rarely spotted elsewhere in Delhi, are the Brook's leaf warbler, Olivaceous leaf warbler and Large crowned leaf warbler. Winter migrants do not breed in the Ridge forest.

Summer Migrant Species

There are a few summer migrants which come to the Ridge between March and October, such as the Koel, Pied crested cuckoo, Common Indian nightjar, Bluecheeked bee-eater, and Golden oriole. Among these the first two are fairly common on the Ridge. The last three are less frequently met with; indeed, the Common Indian nightjar does not seem to have been recorded in any other part of Delhi. These species have been found breeding here as well.

Local Migrant Species

Some local migrant species spotted here are the Comb duck or Nakta, Indian longbilled vulture, Green bee-eater, and Crested bunting, all of which are more or less common in Delhi and its surrounds.

Passage Migrant Species

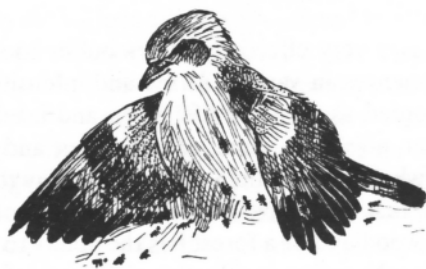
These are infrequently seen on the Ridge and other areas of Delhi, and comprise such colourful birds as the Common rosefinch, Dull green leaf warbler, Verditer flycatcher, Tytler's leaf warbler, Blyth's reed warbler, Rosy pastor, Franklin's nightjar and The cuckoo.

Passage migrants may visit the Ridge in spring and/or in autumn, but do not breed here.

Occasional Visitors/Vagrants

For serious (and patient!) birdwatchers there is also the exciting possibility of spotting rare, occasional visitors to the Ridge both during summer and winter. In the past, birds such as the Large cuckoo-shrike, Marshall's iora, Dusky horned owl, Indian pied hornbill, Scop's owl, Peregrine falcon, Redheaded merlin and Imperial eagle have been reported from the Ridge and the list could go on. Most certainly, new names will be added to this list of surprises in the years to come, if the Ridge survives.

It is clear that the Ridge is the most important single, relatively undisturbed part of Delhi large enough to sustain sizable breeding and non-breeding populations of a large variety of birds. This itself is reason enough to conserve it in as natural a state as possible.



USES OF THE RIDGE

In a city with such intense land pressure, the question is naturally asked: why preserve the Ridge? Why not convert it into housing and office complexes, stadia, and the like?

The answer is multidimensional, for this green area is not only important in itself, but also performs a variety of functions which are crucial in the life of Delhi's citizens.

- * A forest, with its flora, is a purifier of air, a sink for some pollutants, a replenisher of oxygen in the atmosphere.
- * It is nature's foremost line of defense against the soaring mercury. While travelling in Delhi, one experiences a distinctive change in the quality of air and in temperature when moving towards the Ridge --- whether it is going upwards from the Inter-State Bus Terminal in North Delhi, or commuting from Karol Bagh to Dhaula Kuan in West Delhi. Temperatures inside the Ridge can be several degrees below normal city temperature. But the cooling effect is not restricted to the Ridge itself, it extends to a much larger area.
- * Delhi is plagued by dust, much of it blowing in from the west. But were it not for the Ridge, it would be infinitely worse. As a forested spur coming from Rajasthan, the Ridge acts as a barrier to dust and desertification, both physically as a wall, as well as due to the dust-absorbing properties of vegetation.
- * This forest acts as a very effective noise - buffer too. Noise, which the city-dweller experiences in various forms and intensities throughout the day, is often accepted as a fact of life. Born and used to the discordant notes of vehicular noise, the hum of industries and all the other city noises, it is only when we take time off for a holiday to a quiet place and return to the city, that we realize the actual intensity of noise that we live with everyday. A woodland or a forest has the ability to absorb such noise, with leaves and trunks acting as effective absorbers of sound waves. This is again an irreplaceable function of the Ridge in its wild form. Artificial parks without dense undergrowth and having sparse trees can play only a limited role as a noise buffer.

- * Little realized, but nevertheless vital, the Ridge also serves as a source of fodder and fuelwood for many poor people living in its vicinity.
- * The Ridge forest holds immense potential as an educational aid. To teach a child about forests and the environment around, and to allow it to imbibe the real beauty of forests, it is imperative to first show the child what a forest actually is. To carry the message of preserving the environment and to execute action, it is important that each one of us --- child and adult, alike --- actually sees, feels and tries to understand the patterns and processes which rule a natural community of plants and animals.

The recent trend towards converting the Ridge forest into a park is unwise, if the above-mentioned functions of the Ridge are considered important. A park or a rolling lawn with a few attractive plants cannot counter the experience of walking through a forest and hearing the wild calls of partridges and peafowl. Also, a parkland, however green, will be unable to create that intricate and highly tuned web of natural inter-relationships which has evolved over time.

- * The Ridge is a beautiful green maze during the monsoons, a riot of colour in summer when the Palash (*Butea monosperma*) and the Amaltash (*Cassia fistula*) bloom and a dry, brown, restless expanse in June, in anticipation. Its moods are varied, with nature weaving her way through the gamut of the seasons. Delhi is a fortunate city, with its dimensions, to have a green heart. Many a morning-walker, nature-lover or just a passer-by, feels at home in this green wilderness, sheltered and away from the dusty madness of city life.

As important as the various advantages offered by the Ridge to Delhi's human inhabitants, is its intrinsic worth. As a part of the Aravalli hill system (though supporting a number of plants which have been introduced at various points of time), it has retained the semi-arid scrub vegetation characteristic of this system. Since such an ecosystem is under threat everywhere on the Aravallis, every major stretch like the Ridge must be conserved. It is, moreover, a home to millions of non-human living creatures, who have as much a right to live as do humans. In a world so overwhelmingly dominated by *Homo sapiens*, surely we can leave these animals and plants a bit of space?

THE ABUSE OF THE RIDGE*

Many citizens of Delhi remember the days when the Ridge was a forest where one could easily get lost. Today, this is almost impossible, because one is rarely far from some sign of human activity, be it a petrol station or a road, a school or a park, a jhuggi colony or a police camp. So rapidly is the Ridge shrinking that in some parts it has almost been wiped out - with only a few, lonely Kikar trees and a closely cropped rocky mound, a pathetic vestige of what was once a flourishing ecosystem.

The destruction of the Ridge started way back in the 1920s and 1930s, when access to the upcoming colonies in West Delhi (Karol Bagh, for example) was gained by actually blasting away a large chunk of the hills, where today Jhandewalan and Sadar Bazaar are. Since then, the damage has increased ten-fold. A series of intrusions, legal and illegal, have devoured more and more area.

According to Delhi's first Master Plan (1961-1981), the Ridge was to be given its due importance as a natural forest, and be preserved and protected as such. The plan saw the possibility of developing the Ridge along the lines of New York's Central Park, though it did not specify what this meant in any detail [Sekhon 1982]. But 26 years later, nothing tangible has emerged in this direction. **In 1982, the Town and Country Planning Organization (TCPO), in a 'secret' note, pointed out that the Delhi School of Planning and Architecture, in a study, had found that 40% of the Ridge had already been destroyed [TCPO 1982].** The TCPO report mentions the large number of intrusions, including illegal encroachments, that have taken place since the promulgation of the first Master Plan. The Land and Development Office of the Ministry of Works and Housing, the Delhi Development Authority, and other agencies in charge of various parts of the Ridge (see Chapter 7 for details) have, bit by bit, allocated large parts of the forest for some kind of human activity or the other.

* (See map on the next page for locating the various destructive activities that have taken place on the Ridge, as described in this chapter).

The major activities leading to the destruction of the Ridge have been:

1. Construction of buildings, roads and establishment of human settlements, by the government as well as private parties.
2. Conversion of forest into parklands.
3. Miscellaneous activities like garbage dumping, lopping for fuel and fodder, and grazing by livestock.

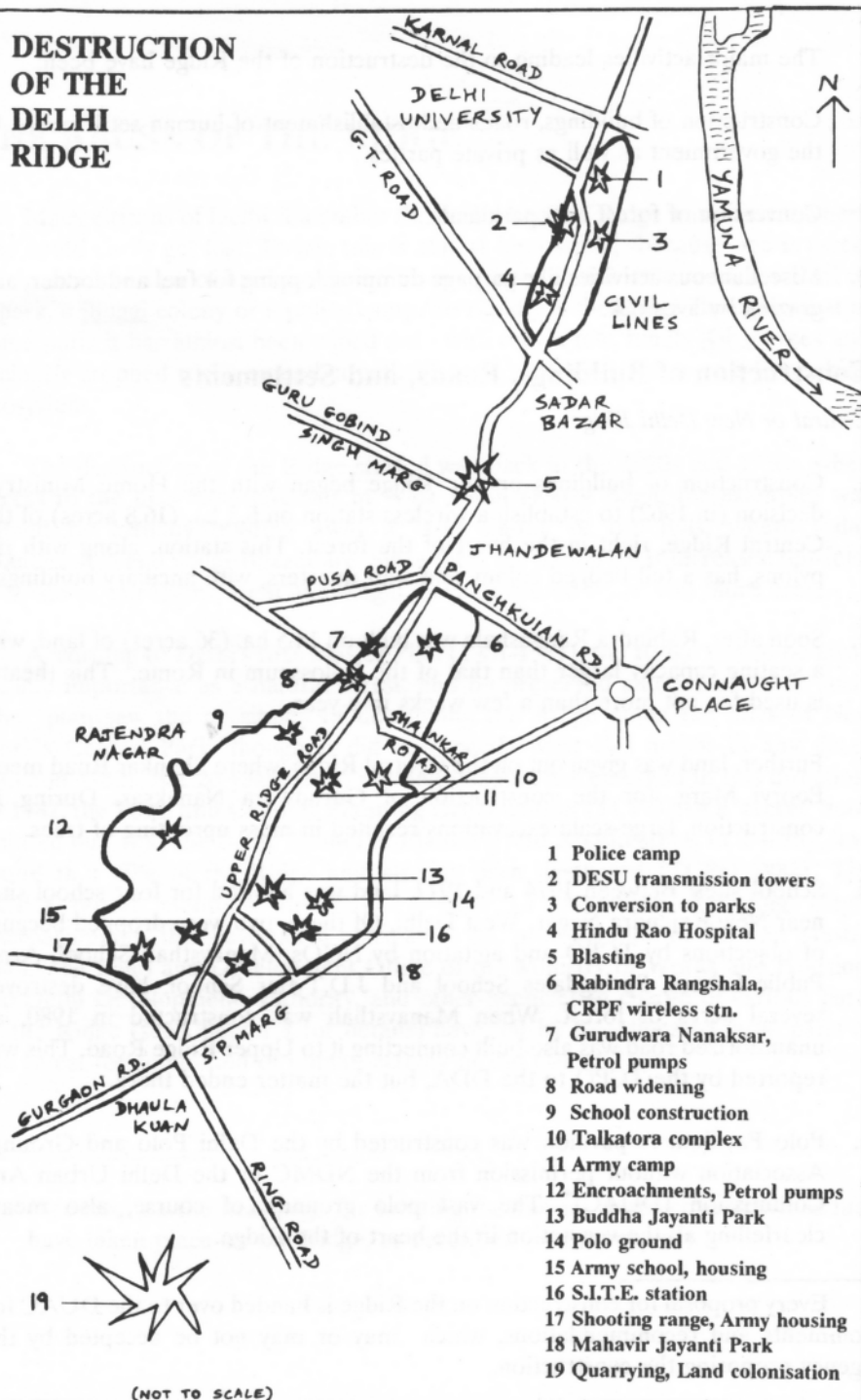
Construction of Buildings, Roads, and Settlements

Central or New Delhi Ridge

- a. Construction of buildings on the Ridge began with the Home Ministry's decision (in 1962) to establish a wireless station on 6.5 ha. (16.8 acres) of the Central Ridge, right in the heart of the forest. This station, along with the pylons, has a full-fledged colony and staff quarters, with ancillary buildings.
- b. Soon after, Rabindra Rangashala was built on 14.5 ha. (36 acres) of land, with a seating capacity larger than that of the Colosseum in Rome. This theatre is used for not more than a few weeks in a year.
- c. Further, land was given out on the Central Ridge, where Shankar Road meets Poorvi Marg, for the construction of Gurudwara Nanaksar. During its construction, large-scale excavations resulted in mass uprooting of trees.
- d. School sites: Between 1974 and 1977, land was allotted for four school sites near New Rajendra Nagar, West Delhi. Of these, two were dropped because of objections by TCPO and agitation by NGOs. Manavsthal School, Army Public School, Springdales School and J.D.Tytler School, have destroyed several acres of forest. When Manavsthal was constructed in 1980, an unauthorized road was also built connecting it to Upper Ridge Road. This was reported by the TCPO to the DDA, but the matter ended there.
- e. Polo Pavilion: A pavilion was constructed by the Delhi Polo and Grounds Association without permission from the NDMC or the Delhi Urban Arts Commission (DUAC)*. The vast polo grounds, of course, also meant clearfelling all the vegetation in the heart of the Ridge.

* Every proposal for construction on the Ridge is handed over to the DUAC for comments and recommendations, which may or may not be accepted by the agency proposing the construction.

DESTRUCTION OF THE DELHI RIDGE



- f. S.I.T.E.: A small plot of land was allotted to the Satellite Instructional Television Experiment (S.I.T.E.) on a temporary basis. The intrusion is now permanent.
- g. Widening of Shankar Road: Hundreds of trees were felled in 1981-82 to widen Shankar Road for the 1982 Asian Games.
- h. Defence Establishments: The Defence Services Club, Dhaula Kuan, Defence Personnel Residential buildings in Dhaula Kuan and on SP Marg, and the Army Public School complex have taken up a vast area of the Ridge.
- i. Slum Colonies:
 - (i) A colony of 15-20 huts behind the NDMC swimming pool on Mandir Marg, probably of labourers brought in to work on the site. Created in the 1970s, it was demolished during the Emergency (1975-77), but since then has come up again. The fuel needs of the inhabitants are met from the adjacent forest.
 - (ii) A colony of 25 huts behind Springdales School on Pusa Road, believed to have come up in the early 1980s.
 - (iii) A small hutment of 15 houses next to the Microwave station in New Rajendra Nagar Ridge. The inhabitants rear cows and buffaloes (about 40 in number) and supply milk to New Rajendra Nagar.
- j. Hanuman Mandir: Situated on Rabindra Rangshala Marg, it also has a small private nursery next to it.

There have been many more constructions and intrusions, probably illegal, as no government agency has any data on them. These include petrol pumps, a large number of which have sprung up along the roads criss-crossing the Ridge.

North Delhi Ridge

- a. CRPF Station : This extends over half a hectare, towards the eastern edge of the Ridge.

- b. Delhi Administration's Forest Department office and nursery: Spread over more than 2 ha., these occupy much of the Ridge area sandwiched between Roshanara and Chauburja roads.
- c. Hindu Rao Hospital: Starting as a tiny unit, the complex has gradually taken up more and more of the Ridge area, and now covers about a hectare.
- d. Weight Lifting Club and Youth Centre opposite the Delhi University Gate.
- e. A small temple near the Flagstaff monument on top of the Ridge.
- f. A small masjid on the Mall Road, on the eastern edge of the Ridge.
- g. Police Station: A large area adjacent to University Rd., since 1988 houses a large police station 'against eve-teasing and drugs'.
- h. Animal Care Centre next to the above, set up in 1989.
- i. Roads and pipelines criss-crossing the Ridge.
- j. Tea shops near Revenue Tax Office, on Rajpur Road.
- k. Transmission towers, 16 of which have been made by DESU on DDA-controlled land. Started in 1988, this construction is in violation of the Forest (Conservation) Act of 1980, under which Central Government clearance has to be obtained for conversion of any forest area into non-forest use. DDA never took this permission. Further tower construction, and laying of the transmission lines, has been stayed in March 1991 after strong protests by Kalpavriksh. At the time of sending this book to print, the matter has been referred to the Union Ministry of Environment and Forests.

Conversion of Forests into Parklands

This is perhaps the most complex problem threatening the Ridge ecosystem. Most of our city planners strongly favour conversion of the forest into a semi-wild parkland (by cutting the undergrowth) or into totally new parklands (by planting ornamental trees and shrubs after removing most of the original vegetation). They argue that parks are more useful for people and would, in any case, serve the same ecological purpose as a forest. As a result many hectares of the North and Central Delhi Ridges have been converted into parks. Though this may not seem important

to most joggers and strollers, such activity has wreaked havoc upon the scrub vegetation of the Ridge.

Large gardens such as the Buddha Jayanti Park and Mahavir Vanasthali in the Central Ridge were created by *en-masse* cutting of naturally occurring shrubs and trees, and plantation of species, of which many are exotic. In this attempt to 'discipline' nature, it is not realized, that once cleared of its shrubbery and wild growth, the whole aspect of a forest changes. Many birds and mammals may disappear or decline, and indigenous species of plants get phased out by weeds and exotics. The whole web of patterns and processes of a self-sustaining ecosystem which has evolved over time is disturbed, only to create dressed-up, carefully tended lawns. Adding to the woes is the massive financial and resource drain such ill-conceived ventures are, for now the area needs an artificial water supply, gardeners and chowkidars, etc.

Parks are certainly essential in a city like Delhi, but they can easily be planned in other areas (already denuded of forests), without tampering with the Ridge.

Other Pressures

Several other activities, individually small but cumulatively adding to the damage, have plagued the Ridge. These include garbage dumps, e.g. the one next to the S.I.T.E. station on Sardar Patel Marg. About one-fourth of a hectare (1 acre) in area, it is filled with rubbish from the President's Estate and surrounding areas. Since much of this is non-biodegradable, the vegetation over the area has little chance of regeneration. Tree-felling for fuel, grazing and fodder collection are other pressures, though not so significant. A few places are also affected by temporary camps set up by graziers who survive on selling milk and milk products.

The above is possibly only a part of the picture, built up from records of agencies like TCPO, or visually recorded by members of Kalpavriksh and other NGOs. There may be many more incursions into the Ridge, which have escaped our attention.

A firm and clearcut policy is needed to conserve whatever remains of the Ridge. What concrete strategies should be adapted for this? The last chapter attempts to present the outline of such a blueprint.

THE ADMINISTRATIVE AND LEGAL MESS

According to officers of the Forest Department of the Delhi Administration, the Ridge forests have been notified as Reserved Forests under the Indian Forest Act of 1878. They say that this was done way back in the later part of the 19th century, perhaps in 1878 itself [Ganguli 1975]. Unfortunately, it has not been possible to trace the notification. But it is evident that no governing body has ever implemented or tried to implement the provisions of the Indian Forest Act, as applicable to a Reserved Forest.

In the late 1960s (the exact date is uncertain), control over portions of the Ridge was handed over to the various local administrative bodies of Delhi. The motivation for this action is unclear. Today, the Delhi Development Authority (DDA), the New Delhi Municipal Corporation (NDMC), the Delhi Administration (DA), Central Public Works Department (CPWD), and the Land & Development Office (L&DO) of the Union Ministry of Works and Housing, control different parts of, or different functions on, the Ridge. In the New Delhi (Central) Ridge, 140 ha. (350 acres) of land is with the CPWD, including the Mahavir Vanasthali and Buddha Jayanti parks. The Delhi Administration (near Birla Mandir) and NDMC (along Willingdon Crescent), hold about 18-20 ha. (45-50 acres) each. The rest is in the hands of the L&DO. In the North Delhi Ridge, the DDA holds the major portion, while the Forest Department of DA controls a small area sandwiched between Roshanara Road and Chauburja Marg.

In addition, bodies like the Town and Country Planning Organisation (TCPO), and the Delhi Urban Arts Commission (DUAC), are supposed to have a say in decisions related to the Ridge.

As mentioned earlier in this report, the Master Plan for Delhi (1962) identified the importance of the Ridge as one of the most important natural elements of the city to be conserved, and recommended that the entire Ridge should be preserved as close to an undisturbed forest as possible in the form of a Regional Park. It also suggested that "it should remain in its natural state with regular weeding and clearing of undesirable undergrowth." Many nature-lovers would strongly object to this definition of "preserving an undisturbed forest", as suggested in the Master Plan. Even if that is acceptable, it is abundantly clear that no concerted effort has ever been made to evolve an integrated plan for the preservation/development of the Ridge forests in relation to the whole city.

In 1980, after efforts by some citizens of Delhi, the then Lieutenant-Governor of Delhi, Shri Jagmohan declared a large portion of the Ridge as protected. This

may have been a sincere effort towards its preservation, but the legality of the order was unclear, since, to the best of our knowledge, no portion of the forests had been denotified from the original Reserved Forest status, and no new notification was issued. In effect, this was yet another in the long list of paper promises, as is clear from the fact that incursions into the Ridge, legal and illegal, have continued even after this announcement (see Chapter 6). In fact there are many instances of the TCPO's and DUAC's recommendations, even strong objections regarding proposed construction on the Ridge, being totally disregarded.

As admitted by several officials in the Delhi Administration and other government bodies, the multiplicity of organizations controlling the Ridge has led to a number of problems:

- * Autonomous local bodies like the DDA go ahead with construction and clearing works without considering the impacts. Each organization has its own plans and norms (if any !) for the Ridge, and there is no final authority to take and whet decisions. Recommendations of the DUAC and are not binding on any of the governing bodies. So the end result is, at best, chaotic, and at worst, disastrous.
- * No plan for integrated development of the Ridge, with conservation as the focus, has even evolved due to this confusing situation in which even its exact legal status is unclear. Thus the natural forest gets converted to parks, while barren or denuded land lies unused, neglected by the authorities.
- * "Passing the buck" is a game frequently indulged in by the various agencies. Many a time, citizens in their attempts to check encroachments have been thwarted by officials of one agency putting the responsibility on another, which in turn shifts it to a third!
- * None of the governing bodies have Forest Departments (except Delhi Administration, which controls only a tiny potion of the Ridge). The horticultural departments of DDA and NDMC strongly believe in clearing the Ridge of its natural or naturalized vegetation, especially undergrowth, and creating parks. They do not have the intention of preserving the Ridge in its natural state.

The Forest Department of the Delhi Administration has repeatedly requested that control over the entire Ridge be handed over to it. This view has been endorsed by the Union Ministry of Environment and Forests, especially by Mrs. Maneka Gandhi as Minister of State in this Ministry. But government departments do not want to give up 'their territories' so easily, and so far DDA, L&DO, NDMC, and CPWD have all 'pooh-poohed' the suggestion.

CAN WE RESCUE THE RIDGE? A BLUEPRINT FOR PROTECTION

The immense importance of the Ridge for the inhabitants of Delhi, as also the implications of its loss, have been emphasised in the preceding text. It is imperative that whatever remains be protected from further denudation, and that degraded areas be helped and allowed to regenerate. For this, we propose below a set of recommendations that could be acted upon by governing bodies, as well as by local voluntary groups and individuals concerned about the future of this area.

Governmental Action

1. The most important administrative step which would significantly contribute to the preservation of the Ridge, would be to hand over control of the entire area to the Forest Department of the Delhi Administration (DA). As mentioned in Chapter 7, this suggestion has already been made by DA itself, and endorsed by the Union Ministry of Environment and Forests. Handing over charge to one body would reduce the administrative confusion and 'free-for-all' situation that today plagues the Ridge. It appears natural that this body be the Forest Department. This would also make it possible for officials trained in forest conservation to take charge, though of course continuous public scrutiny of their performance would still be needed, for forest officials can sometimes be as much the enemies of conservation as anyone else. Past record of the Forest Department in Delhi with regard to the Ridge, however, inspires some confidence that they will make protection their focus.
2. There should be a strict ban on any further construction on the Ridge, except limited expansion of some existing structures, where absolutely necessary. Any such expansion, however, should be deemed to attract the provisions of the Forest (Conservation) Act of 1980, under which Central Government permission will have to be taken by the agency proposing it.
3. All existing structures on the Ridge need to be reviewed in terms of their present and future impact on the ecosystem, and an assessment made of the possibility of shifting them out.
4. Conversion of forests into parks should be halted with immediate effect, except the limited conversion on the edges of the Ridge being suggested below (see point 6).

5. There is an urgent need for augmentation of existing protection staff (hardly any seems to exist today), and their qualitative upgrading in terms of appropriate training. A system of Honorary Wardens, into which citizens are recruited, would greatly help in the area's protection, as also check official bungling.
6. The entire Ridge must be demarcated into separate zones, e.g. Buffer or Recreation Zone, Research and Education Zone, and Wildlife Habitat Zone. Public activity should be severely restricted in relatively undisturbed areas, which are still rich in flora and fauna, designated Wildlife Habitat Zones. In Research and Education Zones, only those studying the area, or using it as resource for spreading awareness, should be allowed. This zoning exercise must be done by a body consisting of government officials, representatives of NGOs, and local residents.

A Buffer or Recreation Zone needs also to be built up, consisting of a surrounding belt of plantations and parks, from where poor people can meet their needs of fuel, fodder, and other daily essentials, and where surrounding populations can go for casual recreation. This would be the only justification for further conversion of wilderness into parks, and must be done only on the periphery of the Ridge, in a thin strip. Since this would also reduce pressure on existing parks which go deep into the Ridge, parts of these could be left to grow wild again, to compensate for the conversion proposed above.

7. Security of visitors to the Ridge is a major problem which needs to be looked into. Special staff may need to be deputed against anti-social activities taking place in isolated areas of the Ridge, so that naturalists and trekkers can enjoy their visits there.
8. Financial and other support should be extended to NGOs, schools, colleges, and other agencies which take up educational and research work on the Ridge.

Voluntary Action - What You Can Do

Voluntary groups and concerned individuals at the local level can contribute towards the protection and appropriate use of the Ridge by creating awareness, keeping a look-out for new encroachments, and conducting amateur or professional studies on the flora, fauna, and ecology of the area.

1. A number of educational and awareness-raising activities can be carried out:

- a. Taking children and nature lovers out on the Ridge for nature walks, so that they get a first hand experience of the richness and variety of life on, and the threats to, the Ridge.
 - b. A widespread publicity-cum-awareness campaign, including: preparing pamphlets, exhibitions and scientific literature on the Ridge, and distributing and displaying these in schools, colleges, and among the general public.
 - c. Marking out routes for nature walks in specific areas of the Ridge.
 - d. Using the mass media by writing articles, giving press releases, making radio programmes, etc.
2. Birdwatchers and nature lovers could regularly record all the plant and animal life they observe and identify on the Ridge, and later compile it to create a data bank over time. Regular flora and fauna research can be conducted in the form of bird counts, periodic observations, etc.

The zoology and botany departments of the colleges in the North and South Campus of Delhi University could especially contribute in this task. They need, however, to stop their stress on plant and insect collections, a lot of which are still carried out on the Ridge. Instead of these destructive activities, more observational study could be undertaken by the students.

3. NGOs and individuals could start signature campaigns against further construction and deforestation on the Ridge, talk to the officials concerned, publicly demonstrate, and write about it in newspapers and magazines. **There is no substitute to an alert and widespread network of such people, for effective protection of the Ridge.**

The Fight to Save the Ridge - Work Being Done by Delhi NGOs

In late 1979, about 250-300 people -- students and other concerned citizens -- demonstrated against the plans of the Delhi Administration for construction work on the Ridge. The protest was not immediately successful, but later led to sustained pressure which forced the Delhi Administration to declare it a protected area (see Chapter 7).

The protest also led to the formation of *Kalpavriksh* (KV), a group of nature-lovers and environmentally-conscious people. Since this initial effort, KV has over the years, been actively campaigning against destructive activities on the Ridge through letters, memoranda, meetings with officials, media exposure, and, when all this does not work, demonstrations and physical blockades of deforestation.



Educational work has also been in progress in the form of nature walks, slideshows and workshops for school and college students. Bi-annual bird counts are held in two areas of the Ridge, in addition to observations during nature walks. The publication of this booklet is yet another effort towards increasing awareness about the plight of the Ridge among the Delhi public.

A few other groups have from time to time taken up cudgels on behalf of the Ridge, or used it for educational purposes. The *Ridgewoodpeckers*, a group of students of the Army Public School, is a dedicated band of birdwatchers and animal-lovers. They frequent the Ridge for study and photography of flora and fauna, and have developed a nature trail in a portion of the Ridge near their school. The *Society for the Conservation of the Yamuna and the Ridge* is a more recent group of academics, nature lovers, and eminent people, who have organised meetings to draw public attention. The *Delhi Conservation Society*, the *National Museum of Natural History*, *Shrishti*, and schools like *Sardar Patel Vidyalaya*, frequently use the Ridge for educational visits. The list of such groups is fortunately growing, but many more are needed in this last-ditch battle to save the Delhi Ridge forest.

Appendix - 1

Mammals Recorded in Delhi, Including the Ridge

<u>Order</u>	<u>Latin Name</u>	<u>Common Name</u>	<u>Current Status</u>
Carnivora	<i>Hyaena hyaena</i>	Striped hyena	X
	<i>Canis lupus</i>	Indian wolf	X
	<i>Vulpes</i> sp	Fox	?
	<i>Canis aureus</i>	Jackal	P
	<i>Panthera pardus</i>	Leopard	X
	<i>Herpestes edwardsi</i>	Common mongoose	P
	<i>Herpestes auro-punctatus</i>	Small Indian mongoose	P
	<i>Sus scrofa cristatus</i>	Indian wild boar	X
	<i>Felis bengalensis</i>	Leopard cat	P
	<i>Viverricula indica</i>	Small Indian civet	?
Ungulata	<i>Boselaphus tragocamelus</i>	Nilgai	P
	<i>Gazella gazella</i>	Chinkara	X
	<i>Antelope cervicapra</i>	Blackbuck	X
	<i>Axis porcinus</i>	Hog deer	X
Primata	<i>Macaca mulatta</i>	Rhesus macaque	P
Lagomorpha	<i>Lepus nigricollis</i>	Indian hare	P
Chiroptera	<i>Megaderma lyra</i>	Indian false vampire bat	?
	<i>Pteropus giganteus</i>	Flying fox	P
	<i>Pipistrellus coromandra</i>	Indian pipistrelle	P
Rodentia	<i>Hystrix indica</i>	Indian porcupine	?
	<i>Tatera indica</i>	Indian gerbille	P
	<i>Rattus</i> sp.	Field rat	P
	<i>Mus booduga</i>	Indian field mouse	?
	<i>Meriones hurrianæ</i>	Indian desert gerbille	?
	<i>Funambulus pennanti</i>	Five-striped palm squirrel	P
	<i>Bandicota bengalensis</i>	Indian mole-rat	?
Insectivora	<i>Suncus murinus</i>	Grey musk shrew	?
	<i>Hemiechinus auritus</i>	Longeared hedgehog	P
Pholidota	<i>Manis crassicaudata</i>	Indian pangolin	?

* X: Presently absent, recorded till 1940

P: Present ?: Survival uncertain/questionable

References: Delhi Administration 1976; Kalpavriksh records 1981-1989; Ridgewoodpeckers' records; Hawkins 1986; Prater 1971

Appendix 2

Amphibians and Reptiles of the Delhi Ridge

<u>Order</u>	<u>Latin Name</u>	<u>Common Name</u>	<u>Current Status</u>
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Amphibians

Anura	<i>Bufo melanostictus</i>	Common toad	P
	<i>Rana tigerina</i>	Indian bullfrog	P

Reptiles

Suborder	<i>Hemidactylus</i>	Northern house gecko	P
Lacertilia	<i>flaviviridis</i>		
(lizards)	<i>Calotes versicolor</i>	Common garden lizard	P
	<i>Mabuya dissimilis</i>	Striped grass skink	P
	<i>Uromastyx hardwickii</i>	Spiny tailed lizard	?
	<i>Varanus bengalensis</i>	Indian monitor lizard	P
Suborder	<i>Naja naja</i>	Indian cobra	?
Ophidia	<i>Bungarus caeruleus</i>	Common krait	?
(snakes)	<i>Vipera</i> sp.	Viper (Russells?)	?
	<i>Ptyas mucosus</i>	Rat snake	P
	<i>Python molurus</i>	Indian python	?
	<i>Typhlina bramina</i>	Common wormsnaek	?
	<i>Psammophis leithi</i>	Leith's sandsnake	?
	<i>Lycodon aulicus</i>	Common wolfsnake	?
	<i>Eryx johnii</i>	Red sand boa	?

References: Delhi Administration 1976; Kalpavriksh records 1981-1989; Daniel 1983; Hawkins 1986



Appendix 3

Arthropods of the Delhi Ridge

CLASS INSECTA

Order Lepidoptera (Butterflies and moths)



Scientific Name

Common English Name

BUTTERFLIES

Spialia galba

Indian skipper

Erionota thrax

Palm redeye

Pelopidas mathias

Small branded swift

Papilio polytes

Common Mormon

Papilio demoleus

Lime butterfly

Papilio clytia

Common mime

Leptosia nina

Psyche (doubtful record)

Cepora nerissa

Lesser gull

Anapheis aurota

Pioneer

Appias libythea

Striped albatross

Ixias marianne

White orange tip

Pieris canidia

Indian cabbage white

Ixias pyrene

Yellow orange tip

Colotis amata

Small salmon Arab

Colotis fausta

Large salmon Arab

Colotis etrida

Little Orange tip

Colotis danae

Crimson tip

Catopsilia pomona

Lemon emigrant

Catopsilia pyranthe

Mottled emigrant

Eurema brigitta

Small grass yellow

Eurema laeta

Spotless grass yellow

Eurema hecabe

Common grass yellow

Appias albina

Common albatross

Colias electo

Dark clouded yellow

Tarucus nara

Striped Pierrot

Tarucus balkanica

Black-spotted pierrot

Tarucus indica

Pointed pierrot

Tarucus callinara

Spotted pierrot

Syntarucus plinius

Zebra blue

Azanus ubaldus

Bright babul blue

Azanus uranus

Dull babul blue

Syntarucus jesous

African babul blue

Chilades laius
Freyeria trochilus
Zizina otis
Zizeeria maha
Zizeeria knysna
Zizula gaika
Euchrysops cnejus
Euchrysops parrhasius
Catachrysops strabo
Spindasis vulcanus
Spindasis ictis
Rapala iarbus
Virachola isocrates
Hypolimnas misippus
Precis hierta
Precis orithya
Precis almana
Phalanta phalantha
Cynthia cardui
Precis lemonias
Argyreus hyperbias
Ariadne merione
Danaus chrysippus
Danaus genutia
Danaus limniace
Euploea core
Mycalasis perseus
Ypthima inica

Lime blue
 Grass Jewel
 Lesser grass blue
 Pale grass blue
 Dark grass blue
 Tiny grass blue
 Gram blue
 Small cupid
 Forget-me-not
 Common silver line
 Common shot silverline
 Indian red flash
 Common guava blue (doubtful record)
 Danaid eggfly
 Yellow pansy
 Blue pansy
 Peacock pansy
 Common Leopard
 Painted lady
 Lemon pansy
 Indian fritillary
 Common castor (doubtful record)
 Plain tiger
 Striped tiger
 Blue tiger
 Common Indian crow (doubtful record?)
 Common bushbrown
 Lesser threering

MOTHS

<i>Dephnis</i> sp.	(A moth)
<i>Aeries</i> sp.	(A moth)
<i>Acherontia</i> sp.	Hawk moth

Order Hymenoptera (ants, bees and wasps)

<i>Vespa</i> sp.	Vespid wasp
<i>Polistes</i> sp.	Paper wasp
<i>Solenopsis</i> sp.	(An ant)
<i>Athalia</i> sp.	Sawfly

Order Odonata (Dragonflies)



Pantala sp.
Crocothemis sp.

Order Coleoptera (Beetles)

<i>Coccinella</i> sp.	Ladybird
<i>Menochilus</i> sp.	Ladybird
<i>Cicindella</i> sp.	
<i>Scarabaeus</i> sp.	Dung beetle
<i>Mylabris</i> sp.	Blister beetle



Order Orthoptera (Grasshoppers, locusts and Crickets)

<i>Gryllus</i> sp.	House cricket
<i>Grylloides</i> sp.	Field cricket
<i>Gryllotalpa</i> sp.	Mole cricket

Order Isoptera (Termites)

<i>Odontotermes</i> sp.	White ant
<i>Coptotermes</i> sp.	White ant

Order Hemiptera (Bugs)

<i>Bagrada</i> sp.	Stink bug
<i>Chyssocharis</i> sp.	Stink bug
<i>Rhopalosiphum</i> sp.	
<i>Aphis</i> sp.	

Order Diptera

<i>Aedes</i> sp.	(Mosquito)
<i>Anopheles</i> sp.	(Mosquito)
<i>Culex</i> sp.	(Mosquito)

Order Blattodea (Cockroaches)

<i>Blatta orientalis</i>	German cockroach
<i>Periplaneta americana</i> ?	American cockroach

Order Dermaptera (Earwigs)

Labidura sp.

Order Siphonaptera

Pulex sp.

CLASS ARACHNIDA (Spiders, scorpions, etc.)

Order Scorpionida

Galeodes sp.

Buthus sp.

Palamneus sp.

Order Araneae

Epeira sp. (a spider)

CLASS DIPLOPODA (Millipedes)

Thauropygus sp.



CLASS CHILOPODA (Centipedes)

Order Scolopendromorpha

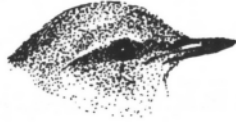
Scolopendra sp.

References: Donahue (1966); Delhi Administration (1976); Wynter-Blyth (1957); Ashton (1972); Ghorpade, pers. comm. (1991)

Note: This list has been reviewed and corrected by Dr. Kumar Ghorpade, Editor, *Colemania: An International Journal of Entomology*. Dr. Ghorpade also kindly sent us detailed listings of butterflies, dragonflies, and damselflies of the Delhi area, suggesting that, since the Ridge is perhaps representative of the vegetated regions of Delhi, these listings would be applicable for the Ridge too. Unfortunately, the lists he sent arrived too late to be used here, but they are available with us for anyone interested.

Appendix 4

Birds of the Delhi Ridge



KEY

H.BK. NUMBER = Number assigned to each bird in Handbook of the Birds of India and Pakistan, by Salim Ali and S. Dillon Ripley, OUP, 1983

ODR = Old (North) Delhi Ridge

NDR = New Delhi (Central) Ridge

A = Abundant

C = Common

U = Uncommon

O = Occasional/Stray

R = Resident

M = Migrant

LM = Local Migrant

PM = Passage Migrant

'-' indicates 'not recorded'

BIRDS OF THE DELHI RIDGE

H.B.K. NUMBER	COMMON NAME	SCIENTIFIC NAME	LOCAL NAME	STATUS IN DELHI	OLD DELHI RIDGE	NEW DELHI RIDGE
9	Cormorant, Little	<i>Phalacrocorax niger</i>	Chhota pankawwa	R	O	-
36	Heron, Grey	<i>Ardea cinerea</i>	Anjan	R	O	-
42	Heron, Pond	<i>Ardeola grayii</i>	Andha bagla	R	U	U
44	Egret, Cattle	<i>Bubulcus ibis</i>	Gai bagla	R	U	U
49	Egret, Little	<i>Egretta garzetta</i>	Kilchia bagla	R	O	O
60	Stork, Painted	<i>Mycteria leucocephala</i>	Dhok	R	-	O
97	Duck, Spotbill	<i>Anas poecilorhyncha</i>	Gugral	R	O	-
115	Duck, Comb	<i>Sarkidiornis melanotos</i>	Nukhta	R	-	O
124	Kite, Blackwinged	<i>Elanus caeruleus</i>	Kapassi	R	U	U
130	Buzzard, Honey	<i>Pernis ptilorhynchus</i>	Madhkare	R	O	-
133	Kite, Pariah	<i>Milvus migrans</i>	Cheel	R	A	-
134	Kite, Blackeared	<i>Milvus migrans</i>		M	-	O
138	Shikra	<i>Accipiter badius</i>	Shikra, Chipka	R	C	O
148	Sparrow-hawk	<i>Accipiter nisus</i>	Basha, Bashin	R	-	C
153	Buzzard, Longlegged	<i>Buteo rufinus</i>	Chuhamar	M	-	U
154	Buzzard, Upland	<i>Buteo hemilasius</i>		M	-	O
157	Buzzard-eagle, White-eyed	<i>Butastur teesa</i>	Tisa	V	-	O
167	Eagle, Imperial	<i>Aquila heliaca</i>	Buta jumiz	R	-	U
168	Eagle, Tawny	<i>Aquila rapax</i>	Okaab	M	-	O
169	Eagle, Steppe	<i>Aquila rapax</i>	Jumiz	R	-	U
170	Eagle, Greater Spotted	<i>Aquila clanga</i>	Kajunga	M	-	U
178	Vulture, Indian Black	<i>Sarcogyps calvus</i>	Raj gidh	M	-	O
182	Vulture, Indian Longbilled	<i>Gyps indicus indicus</i>	Gidh	R	U	O
185	Vulture, Indian Whitebacked	<i>Gyps bengalensis</i>	Gidh	M	-	U
186	Vulture, Egyptian	<i>Neophron percnopterus</i>	Safed gidh	R	C	C
189	Hen-harrier	<i>Circus cyaneus</i>	Pattai, Dastmal	R	-	O

191	Harrier, Montagu's	<i>Circus pygargus</i>		M	-	O
193	Harrier, Marsh	<i>Circus aeruginosus</i>	Safed sira	M	-	O
196	Eagle, Crested Serpent	<i>Spilornis cheela</i>	Dogra cheel	R?	-	U
209/11?	Falcon, Peregrine	<i>Falco peregrinus</i>	Bhyri	M	-	O
212	Hobby	<i>Falco subbuteo</i>	Morassani	M	-	O
219	Merlin, Redheaded	<i>Falco chicquera</i>	Turumti	R	-	O
222	Kestrel	<i>Falco tinnunculus</i>	Narzi, Karontia	M	-	O
238	Partridge, Black	<i>Francolinus francolinus</i>	Kala teetur	R	-	U
245	Partridge, Grey	<i>Francolinus pondicerianus</i>	Teetur	R	A	A
250	Quail, Common	<i>Coturnix coturnix</i>	Bater	M	-	U
311	Peafowl, Common	<i>Pavo cristatus</i>	Mor	R	G	A
343	Waterhen, Whitebreasted	<i>Anaouornis phoenicurus</i>	Dauk, Dawak	R	C	U
347	Moorhen	<i>Gallinula chloropus</i>	Jal murgahi	R	U	U
366	Lapwing, Redwattled	<i>Vanellus indicus</i>	Titoti	R	C	C
370	Lapwing, Yellow-wattled	<i>Vanellus malabaricus</i>	Zirdi	R	-	U
397	Sandpiper, Green	<i>Tringa ochropus</i>	Chupka	M	-	U
398	Sandpiper, Wood or Spotted	<i>Tringa glareola</i>	Chupka	M	-	U
436	Curlew, Stone	<i>Burhinus oedinenus</i>	Karwanak	R	O	U
503	Pigeon, Green	<i>Treron phoenicoptera</i>	Harial	R	U	U
517	Pigeon, Blue Rock	<i>Columba livia</i>	Kabutar	R	A	A
531	Dove, Rufous Turtle	<i>Streptopelia orientalis</i>	Barko/Pahari fakhta	M	-	O
534	Dove, Indian Ring	<i>Streptopelia decaocto</i>	Panduk	R	A	A
535	Dove, Red Turtle	<i>Streptopelia tranquebarica</i>	Girvi fakhta	R	U	U
537	Dove, Spotted	<i>Streptopelia chinensis</i>	Chitta fakhta	M	U	U
541	Dove, Little Brown	<i>Streptopelia senegalensis</i>	Chhota fakhta	R	A	A
545	Parakeet, Alexandrine	<i>Psittacula eupatria</i>	Rai tota	R	U	C

H.BK. NUMBER	COMMON NAME	SCIENTIFIC NAME	LOCAL NAME	STATUS IN DELHI	OLD DELHI RIDGE	NEW DELHI RIDGE
549	Parakeet, Rosinged	<i>Psittacula krameri</i>	Tota	R	A	A
557	Parakeet, Blossomheaded	<i>Psittacula cyanocephala</i>	Tui tota	R	C	C
570	Cuckoo, Pied Crested	<i>Clamator jacobinus</i>	Papiha, Chatak	M	C	C
573	Hawk-cuckoo, Common	<i>Cuculus varius</i>	Papiha	M	U	U
578	Cuckoo, The	<i>Cuculus canorus</i>	Phuphu	M?	-	O
590	Koel	<i>Eudynamis scolopacea</i>	Koel	M	C	C
596	Cuckoo, Sirkeer	<i>Taccocua leschenaultii</i>	Jungli tota	R	-	U
600	Crow-pheasant	<i>Centropus sinensis</i>	Mahoka	R	C	C
606	Owl, Barn	<i>Tyto alba</i>	Ullu	R	U	U
616	Owl, Scops	<i>Otus scops</i>		?	-	U
621	Owl, Collared Scops	<i>Otus bakkamoena</i>	Tharkavi choghud	R	U	U
627	Owl, Great Horned	<i>Bubo bubo</i>	Ghughu	R	-	U
630	Owl, Dusky Horned	<i>Bubo coromandus</i>	Jungli ghughu	R	-	O
650	Owlet, Spotted	<i>Athene brama</i>	Chughad	R	C	C
671	Nightjar, Indian Jungle	<i>Caprimulgus indicus</i>	Chhippak	R?	U	U
675	Nightjar, Longtailed	<i>Caprimulgus macrurus</i>		M?	-	U
680	Nightjar, Common Indian	<i>Caprimulgus asiaticus</i>	Dabchiri	M?	-	U
682	Nightjar, Franklin's	<i>Caprimulgus affinis</i>		M	-	U
703	Swift, House	<i>Apus affinis</i>	Ababeel	R	U	C
719	Kingfisher, Lesser Pied	<i>Ceryle rudis</i>	Kilkila	R	-	U
723	Kingfisher, Common	<i>Alcedo atthis</i>	Chhota kilkila	R	U	U
735	Kingfisher, Whitebreasted	<i>Halcyon smymesis</i>	Bada kilkila	R	C	C
747	Bee-eater, Bluecheeked	<i>Merops superciliosus</i>	Bada patringa	M	-	U
750	Bee-eater, Green	<i>Merops orientalis</i>	Patringa	R	C	C
755	Roller, Indian	<i>Coracias benghalensis</i>	Nilkant	R	C	C
763	Hoopoe	<i>Upupa epops</i>	Hudhud	M	C	C
767	Hornbill, Common Grey	<i>Tockus birostris</i>	Dhandmar	R	U	U
774	Hornbill, Indian Pied	<i>Anthraceroceros malabaricus</i>	Dhan churi	V?	-	O

780	Barbet, Green	<i>Megalaima zeylanica</i>	Bada basanta	R	C	C
792	Barbet, Crimsonbreasted	<i>Megalaima haemacephala</i>	Chhota basanta	R	C	C
796	Wryneck	<i>Jynx torquilla</i>	Gardan evengtha	M	-	O
819	Woodpecker, Lesser Goldenbacked	<i>Dinopium benghalense</i>	Kathphora	R	C	C
847	Woodpecker, Yellowfronted Pied	<i>Picoides mahratensis</i>	Kathphora	R	-	U
875	Lark, Redwinged Bush	<i>Mirafra erythroptera</i>	Aggia	R	-	U
899	Lark, Crested	<i>Galerida cristata</i>	Chendul	R	-	C
907	Skylark, Eastern (Small)	<i>Alauda gulgula</i>	Bhurut	R	-	C
912	Martin, Plain Sand	<i>Riparia paludicola</i>	Mati ababil	R	-	U
916	Swallow, Common	<i>Hirundo rustica</i>	Ababil	M	-	U
922	Swallow, Indian Cliff	<i>Hirundo fluvicola</i>	Nahar ababil	R	-	U
925	Swallow, Redrumped	<i>Hirundo daurica</i>		M	-	O
933	Shrike, Grey	<i>Lanius excubitor</i>	Safed latora	R	U	C
940	Shrike, Baybacked	<i>Lanius vittatus</i>	Lal latora	R	C	C
943	Shrike, Redbacked	<i>Lanius collurio</i>		M	-	O
946	Shrike, Rufousbacked	<i>Lanius schach</i>	Mattiya latora	MR	C	C
953	Oriole, Golden	<i>Oriolus oriolus</i>	Peelak	M	U	U
962/3?	Drongo, Black	<i>Dicurus adsimilis</i>	Korwal	R	C	C
965	Drongo, Ashy	<i>Dicurus leucophaeus</i>	Nila kotwal	M	-	O
994	Myna, Brahminy	<i>Sturnus pagodarum</i>	Kalasir myna	R	C	C
996	Pastor, Rosy	<i>Sturnus roseus</i>	Tilyer	M	U	U
997	Starling	<i>Sturnus vulgaris</i>	Nakshi tilyer	M	U	U
1002	Myna, Pied	<i>Sturnus contra</i>	Ablak	R	C	C
1006	Myna, Common	<i>Acridotheres tristis</i>	Desi myna	R	A	A
1008	Myna, Bank	<i>Acridotheres ginginianus</i>	Ganga myna	R	U	U
1032	Tree Pie, Indian	<i>Dendrocyttia vagabunda</i>	Mahalat	R	C	C
1049	Crow, House	<i>Corvus splendens</i>	Kowwa	R	A	A
1057	Crow, Jungle	<i>Corvus macrorhynchos</i>	Jungli kowwa	R?	C	C

H.BK. NUMBER	COMMON NAME	SCIENTIFIC NAME	LOCAL NAME	STATUS IN DELHI	OLD DELHI RIDGE	NEW DELHI RIDGE
1069	Shrike, Common Wood	<i>Tephrodomis pondicerianus</i>	Keroula	R	U	U
1072/3?	Cuckoo-shrike, Large	<i>Coracina novaeollandiae</i>	Kasya	V?	O	O
1080/3?	Minivet, Scarlet/Orange ?	<i>Pericrocotus flammeus</i>		V?	O	O
1084	Minivet, Shortbilled	<i>Pericrocotus brevirostris</i>	Chotta pahari	M	-	O
1085	Minivet, Longtailed	<i>Pericrocotus ethologus</i>		M	U	U
1091	Minivet, Small	<i>Pericrocotus cinnamomeus</i>	Rajalal	R	C	C
1096	Minivet, Whitebellied	<i>Pericrocotus erythropygus</i>	Safed rajalal	M?	O	O
1102	Iora, Marshall's	<i>Aegithina nigrolutea</i>	Shaubeggi	R	-	U
1119/21?	Bulbul, Redwhiskered	<i>Pycnonotus jocosus</i>	Pahari bulbul	R	A	A
1123	Bulbul, Whitecheeked	<i>Pycnonotus leucogenys</i>	Kushandra	R	U	C
1127	Bulbul, Redvented	<i>Pycnonotus cafer</i>	Bulbul	R	A	A
1148	Bulbul, Black	<i>Hypsipetes madagascariensis</i>		V	-	O
1230	Babbler, Yelloweyed	<i>Chrysomma sinense</i>	Bulal chasm	R	O	U
1254	Babbler, Common	<i>Turdoides caudatus</i>	Dumri, Chilchil	R	C	C
1258	Babbler, Large Grey	<i>Turdoides malcolmi</i>	Bhaina, Sat bhai	R	A	A
1261	Babbler, Jungle	<i>Turdoides striatus</i>	Satbhai	R	A	A
1403	Flycatcher, Spotted	<i>Muscicapa striata</i>		PM	-	O
1411	Flycatcher, Redbreasted	<i>Muscicapa parva</i>	Turra	M	C	C
1421	Flycatcher, Whitebrowed Blue	<i>Muscicapa supercilialis</i>		V?	-	O
1440	Flycatcher, Bluethroated	<i>Muscicapa rubeculoides</i>		V?	-	O
1445	Flycatcher, Verditer	<i>Muscicapa thalassina</i>		M	-	O
1448	Flycatcher, Greyheaded	<i>Culicicapa ceylonensis</i>	Zird phutki	M	U	U

1451	Flycatcher, Whitebrowed Fantail	<i>Rhipidura aureola</i>	Chak dil, Nachan	R	U	U
1460/1?	Flycatcher, Paradise	<i>Terpsiphone paradis</i>	Shah bulbul, Dudhraj	MR	U	U
1498	Warbler, Streaked Fantail	<i>Cisticola juncidis</i>	Ghaski phutki	R	U	U
1503	Wren-warbler, Franklin's	<i>Prinia hodgsonii</i>	Phutki	R	C	U
1506	Wren-warbler, Rufousfronted	<i>Prinia buchanani</i>		R	C	U
1510	Wren-warbler, Plain	<i>Prinia subflava</i>	Phutki	R	C	U
1515	Wren-warbler, Ashy	<i>Prinia socialis</i>	Phutki	R	C	C
1524	Wren-warbler, Yellowbellied	<i>Prinia flaviventris</i>		R	O	O
1535	Tailorbird	<i>Orthotomus sutorius</i>	Darzee	R	C	C
1550	Warbler, Indian Great Reed	<i>Acrocephalus stentoreus</i>		R	C	O
1556	Warbler, Blyth's Reed	<i>Acrocephalus dumetorum</i>	Tiktiki	M	-	U
1557/8?	Warbler, Paddyfield	<i>Acrocephalus agricola</i>		M	-	U
1562/3?	Warbler, Booted	<i>Hippolais caligata</i>		M	-	O
1565	Warbler, Orphean	<i>Sylvia hortensis</i>		M	O	O
1566	Whitethroat	<i>Sylvia communis</i>		M	U	U
1567	Whitethroat, Lesser	<i>Sylvia curruca</i>		M	C	C
1575	Warbler, Brown Leaf	<i>Phylloscopus collybita</i>		M	C	C
1578	Warbler, Tytler's Leaf	<i>Phylloscopus tyleri</i>		M	-	O
1579	Warbler, Tickell's	<i>Phylloscopus affinis</i>		M	-	O
1581	Warbler, Olivaceous Leaf	<i>Phylloscopus griseolus</i>		M	O	O
1587	Warbler, Orangebarred Leaf	<i>Phylloscopus pulcher</i>		M	-	O
1590	Warbler, Yellowbrowed Leaf	<i>Phylloscopus inornatus</i>		M	C	O
1593	Warbler, Brock's Leaf	<i>Phylloscopus subviridis</i>		M	-	O
1601	Warbler, Largebilled Leaf	<i>Phylloscopus magnirostris</i>		M	-	O
1602/4?	Warbler, Dull Green Leaf	<i>Phylloscopus trochiloides</i>		M	U	U
1605	Warbler, Bright Green Leaf	<i>Phylloscopus trochiloides</i>		M	-	O

H.BK. NUMBER	COMMON NAME	SCIENTIFIC NAME	LOCAL NAME	STATUS IN DELHI	OLD DELHI RIDGE	NEW DELHI RIDGE
1606	Warbler, Large Crowned Leaf	<i>Phylloscopus occipitalis</i>		M	-	O
1645	Bluthroat	<i>Erithacus svecicus</i>	Nilkanthi	M	U	U
1661	Magpie-robin	<i>Copsychus saularis</i>	Dharyal	R	C	C
1671	Redstart, Black	<i>Phoenicurus ochruros</i>	Thirthira	M	C	C
1692	Chat, Brown Rock	<i>Ceromela fusca</i>	Dauma	R	-	U
1697	Chat, Stone	<i>Saxicola torquata</i>	Kharpidda	M	-	U
1701	Chat, Pied Bush	<i>Saxicola caprata</i>	Kala pidha	R	-	C
1717	Robin, Indian	<i>Saxicoloides fulicata</i>	Kalchuri	R	C	C
1723	Thrush, Blueheaded Rock	<i>Monticola</i>		V	-	O
		<i>cinclorhynchus</i>				
1733	Thrush, Orangeheaded Ground	<i>Zoothera citrina</i>		M	-	O
1748	Thrush, Tickell's	<i>Turdus unicolor</i>	Desi pawai	M	-	O
1763	Thrush, Redthroated	<i>Turdus ruficollis</i>		M	-	O
1830	Nuthatch, Chestnutbellied	<i>Sitta castanea</i>	Siri	R	-	U
1852/3?	Pipit, Indian Tree	<i>Anthus hodgsoni</i>	Musa richli	M	-	O
1854/5?	Pipit, Tree	<i>Anthus trivialis</i>		M	-	O
1866/7?	Pipit, Brown Rock	<i>Anthus similis</i>		M	-	O
1876	Wagtail, Yellow	<i>Motacilla flava</i>		M	-	O
1881	Wagtail, Yellowheaded	<i>Motacilla citreola</i>	Pani ka pilkya	M	C	U
1884	Wagtail, Grey	<i>Motacilla caspica</i>		M	U	U
1885	Wagtail, White	<i>Motacilla alba</i>	Dhoban	M	C	U
1891	Wagtail, Large Pied	<i>Motacilla</i>	Khanjan	M	C	C
		<i>maderaspensis</i>		R	C	C
1892	Flowerpecker, Thickbilled	<i>Dicaeum agile</i>		V?	-	O
1917	Sunbird, Purple	<i>Nectarinia asiatica</i>	Shakar khora	R	C	C
1933	White-eye	<i>Zosterops palpebrosa</i>	Baboona	R	C	C
1938	Sparrow, House	<i>Passer domesticus</i>	Chiria	R	A	A
1949	Sparrow, Yellowthroated	<i>Petronia xanthocollis</i>	Jungli chiria	R	U	U
1957	Baya	<i>Ploceus philippinus</i>	Baya	R	C	C

1964	Munia, Red or Avadavat	<i>Estrilda amandava</i>	Lal munia	R	U
1966	Munia, Whitethroated	<i>Lonchura malabarica</i>	Charakka	R	C
1974	Munia, Spotted	<i>Lonchura punctulata</i>	Telsa munia	R	U
1976	Munia, Blackheaded	<i>Lonchura malacca</i>	Nakal nok	V	O
2011	Rosefinch, Common	<i>Carpodacus erythrinus</i>	Lal tuti	M	U
2048	Bunting, Whitecapped	<i>Emberiza stewarti</i>	Safedsir gandam	M	O
2050	Bunting, Greynecked	<i>Emberiza buchanani</i>	Jamjohara	M	O
2060	Bunting, Crested	<i>Melophus lathami</i>	Pathar chitra	M	U

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CSIR = Council of Scientific & Industrial Research
JBNHS = Journal of Bombay Natural History Society
OUP = Oxford University Press]

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Coll Scops owl. Sukhatme hostel
June July - 1996

Cat snake - 11-Aug - 96

Sukhatme hostel

Collared Scops owl - June July 1996

Cat snake ? sp. 11-Aug 1996

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